#### 2012 - JCR Evaluation Form

SPECIES: Pronghorn PERIOD: 6/1/2012 - 5/31/2013

HERD: PR202 - BIG HORN

HUNT AREAS: 79 PREPARED BY: TOM EASTERLY

	2007 - 2011 Average	<u>2012</u>	2013 Proposed
Population:	0	N/A	N/A
Harvest:	30	30	60
Hunters:	44	48	70
Hunter Success:	68%	62%	86%
Active Licenses:	45	50	80
Active License Percent:	67%	60%	75%
Recreation Days:	215	233	400
Days Per Animal:	7.2	7.8	6.7
Males per 100 Females	52	49	
Juveniles per 100 Females	59	58	

Population Objective: 0

Management Strategy: Recreational

Percent population is above (+) or below (-) objective: N/A%

Number of years population has been + or - objective in recent trend: 0

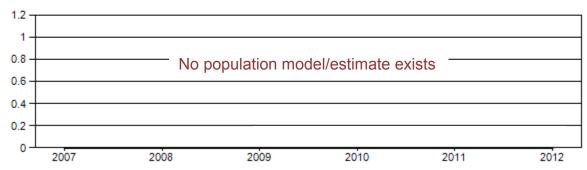
Model Date: None

Proposed harvest rates (percent of pre-season estimate for each sex/age group):

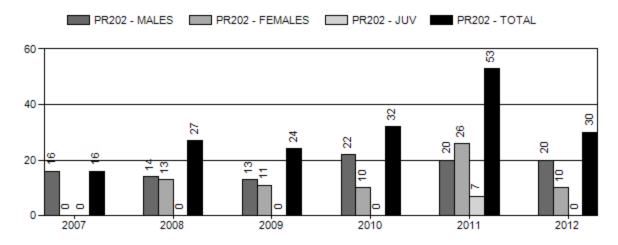
, and the second	JCR Year	Proposed
Females ≥ 1 year old:	na%	na%
Males ≥ 1 year old:	na%	na%
Juveniles (< 1 year old):	na%	na%
Total:	na%	na%
Proposed change in post-season population:	na%	na%

## Population Size - Postseason

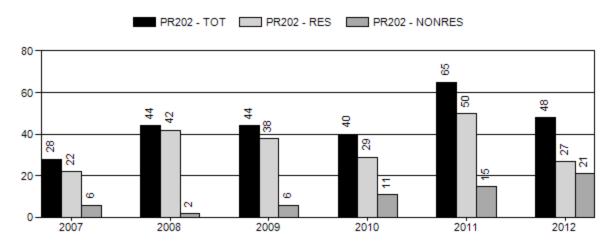
PR202 - POPULATION PR202 - OBJECTIVE



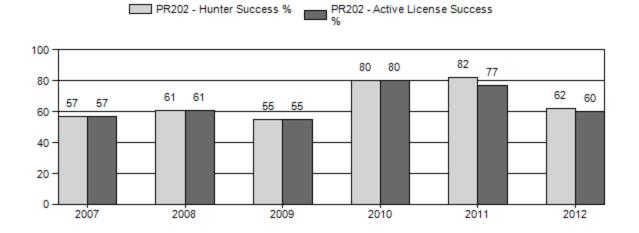
### **Harvest**



## **Number of Hunters**

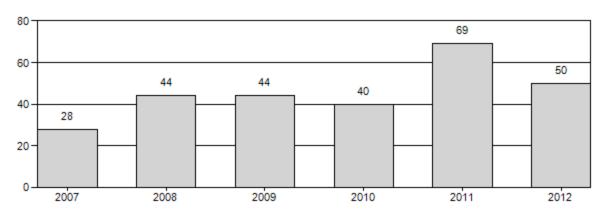


## **Harvest Success**



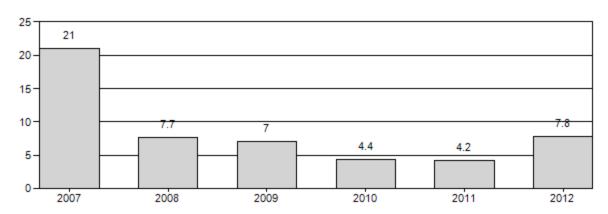
### **Active Licenses**

PR202 - Active Licenses

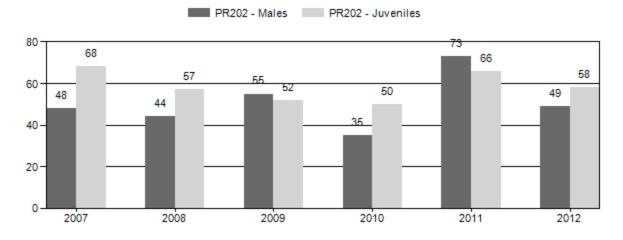


# **Days Per Animal Harvested**

PR202 - Days



# Preseason Animals per 100 Females



#### 2007 - 2012 Preseason Classification Summary

for Pronghorn Herd PR202 - BIG HORN

		MALES		FEMALES JU		JUVEN	JUVE NILES 7		Cls	Males to 100 Females				Young to				
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Cls	Obj	Ying	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2007	0	25	34	59	22%	123	46%	84	32%	266	0	20	28	48	± 0	68	± 0	46
2008	0	21	30	51	22%	1 15	50%	66	28%	232	0	18	26	44	± 0	57	± 0	40
2009	0	23	43	66	27%	120	48%	63	25%	249	0	19	36	55	± 0	52	± 0	34
2010	0	6	19	25	19%	72	54%	36	27%	133	0	8	26	35	± 0	50	± 0	37
2011	0	24	46	70	31%	96	42%	63	28%	229	268	25	48	73	± 0	66	± 0	38
2012	0	30	50	80	24%	162	48%	94	28%	336	0	19	31	49	± 0	58	± 0	39

#### 2012 Preseason Classification by Hunt Area

for Pronghorn Herd PR202 - BIG HORN - Hunt Area ALL

		Ma	ales		Fem	nales	Juve	eniles		Cls	N	/lales/1	00	Young	J/100
Area	Ylg	Adult	Total	%	#	%	#	%	Total	Obj	Ylg	Adult	Males	Female	Adult
79	8	21	29	27%	54	50%	25	23%	108		15	39	54	46	30
116	22	29	51	22%	108	47%	69	30%	228		20	27	47	64	43
Total	30	50	80	24%	162	48%	94	28%	336		19%	31%	49%	58%	39%

**2012 Harvest Data** for Pronghorn Herd PR202 – BIG HORN

								Days/		Licenses
Area	Type	Active Lic/Htrs	Buck	Doe	Fawn	Total	Success	Harvest	Days	Sold
79 CRY	/STAL CREEK									
	Type 9	18	13	0	0	13	72.20%	7.8	101	31
Pooled 1	Гotal	18 (18)*	13	0	0	13	72.20% (72.2%)*	7.8	101	
Pooled F	Resident	14	9	0	0	9	64.30%	9.1	82	
Pooled N	Nonresident	4	4	0	0	4	100%	4.8	19	
116 MA	NDERSON									
	Type 6	20	0	10	0	10	50%	5.1	51	25
	Type 9	16	7	0	0	7	43.80%	11.6	81	0
Pooled 1	Total	34 (36)*	7	10	0	17	50% (47.2%)*	7.8	132	
Pooled F	Resident	16	7	2	0	9	56.20%	8.1	73	
Pooled I	Nonresident	18	0	8	0	8	44.40%	7.4	59	
2012 Hu	ınt Area Total	52 (54)*	20	10	0	30	57.70% (55.6%)*	7.8	233	56
2012 He		48 (50)*	20	10	0	30	62.50% (60%)*	7.8	233	56

<sup>\*</sup>Active Licenses

#### 2013 Hunting Seasons Big Horn Pronghorn Antelope Herd Unit (PR202)

Hunt		Dates of	f Seasons		
Area	Type	Opens	Closes	Quota	Limitations
79	6	Sep. 1	Oct. 31	50	Limited quota licenses; doe or fawn on or within one-half (½) mile of irrigated lands
	9	Aug. 15	Sep. 30	30	Limited quota; any antelope, archery only

Area	Type	Quota changes from 2012
79	6	+50
116	6	-25
Total	6	+25

#### **Management Evaluation**

**Current Management Objective:** none **2012 Postseason Population Estimate:** none

2013 Proposed Postseason Population Estimate: none

**Herd Unit Issues.** Management of this herd unit using a population objective was eliminated in 2001 due to insufficient sample sizes obtained during classification surveys. Without adequate samples, sex and age ratios were unreliable and inadequate for population modeling using Pop-II software. There have been no line transect surveys conducted in this herd unit to obtain an independent population estimate due to the small population and limited flight budgets. No management goals (e.g., count objectives, satisfaction) were established for this herd due to lack of data. This herd will be reviewed in 2014 and management goals will be established.

**Weather.** Habitat quality is probably most affected by desert-like conditions (< 12" annual precipitation) and poor soils. Both of those factors have allowed cheatgrass to invade and dominate some sites. Drought is the most important factor influencing survival and productivity of this antelope herd. Drought conditions occurred in 2000-04 and 2012. Affects of drought on upland vegetation resulted in a shift of antelope to agricultural fields. Landowners have a low tolerance of antelope. In response, the number of doe/fawn licenses has been increased throughout the herd unit.

**Habitat.** Dry conditions and poor soils across most of the herd unit resulted in marginal habitat for pronghorn. Saltbush and mixed shrub communities dominate the area. Sagebrush improves in quantity and quality with higher precipitation and elevation (and better soils) on the east side of the herd unit; however, few pronghorn occur in the "best" habitat. Most antelope in the herd unit concentrate around irrigation canals and stock dams. Bentonite mining has been expanding toward and into the best remaining stands of sagebrush on the west side of the herd unit.

**Field Data.** Drought that occurred across most of Wyoming in summer 2012 did not appear to affect antelope in this herd unit. The fawn:doe ratio obtained from the 2012 classification survey (58:100) was not lower than the 5-year average (2007-2011; 58.6:100). These animals have adapted by relying on irrigation water and irrigated crop land (i.e., pasture, alfalfa). The two shrub transects established in this herd unit (Brokenback, Alkali) were located outside of areas used extensively by antelope (to monitor deer browsing).

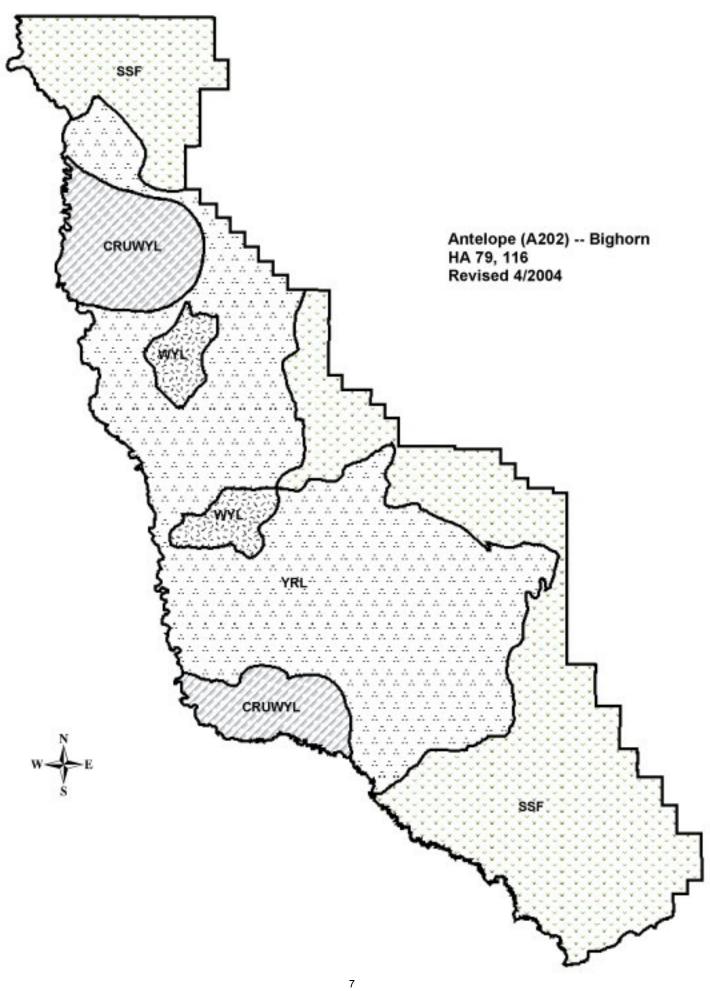
The amount of effort (hours) to survey antelope in this herd unit has not been constant over the years, so trends in classification survey data should not be taken to represent trends in the overall population. This herd unit has been a low priority and classification data was not always collected. As noted, small sample sizes resulted in sex and age ratios that were not an accurate representation of the entire population. Although more data has been collected since 2006, sample sizes were insufficient in some years (e.g., 133 antelope classified in 2010). Excluding 2010, on average (5-year: 2006-09, 2011) 62 fawns:100 does and 54 bucks:100 does were classified; low compared to other herds in Wyoming. Both buck ratios and fawn ratios were showing a slight downward trend until a large increase in both ratios in 2011. More antelope were observed during the 2012 classification survey than ever before (336); buck (49:100) and fawn (58:100) ratios decreased from peaks in 2011. People that have hunted this area for many years report that more antelope can be seen in the herd unit but buck numbers and size have declined. Buck:doe ratios have decreased dramatically since the mid 1990s.

**Harvest Data.** Trends in hunting statistics do not suggest a clear trend in the population. From 1995-2012, recreation days and days per harvested animal have large fluctuations depending on if and how many doe/fawn licenses were issued. Considering only the archery licenses, hunter success has been increasing since 2005. Days per harvest have been trending downward, as has total recreation days, but to a lesser degree. Those statistics suggest that archery hunting for bucks has gotten easier and/or the population has been increasing.

**Population.** Preliminary attempts to construct a reliable population model (spreadsheet) have been marginally successful. Since 2006, more antelope have been observed during classification surveys (>200 animals in most years); thus, more accurate sex and age ratios were expected. Modeling this new area as one distinct population may not be possible (i.e., two distinct populations). Classification data from the two old hunt areas suggested differences in juvenile and adult survival. Movement of antelope between the two areas was minimal.

**Management Summary.** The Big Horn pronghorn herd is a small population (<300 animals), so only limited hunting opportunities (archery only) have been historically offered in Area 79 and 116. Since both Hunt Areas have been managed with the same hunting licenses for approximately the past 10 years, they were merged into one area (79) beginning with the 2013 hunting season. To address depredation to irrigated crops, which has been a concern in a portion of Area 116, wording of the area limitations for the doe/fawn (Type 6) licenses has been changed to address areas with concerns across the entire Hunt Area. Type 6 licenses are proposed to be increased by 25 licenses to cover the increased distribution of hunters across the new area.

Although quantity and quality of data is lacking, it appears the Big Horn pronghorn herd has been increasing. Limited hunting opportunity will continue since the population is low. The area is very popular with archery hunters. Attempts to add rifle hunting (even for does/fawns) has encountered opposition from archery hunters that traditionally hunt in the area.



#### 2012 - JCR Evaluation Form

SPECIES: Pronghorn PERIOD: 6/1/2012 - 5/31/2013

HERD: PR203 - COPPER MOUNTAIN

HUNT AREAS: 76, 114-115 PREPARED BY: BART KROGER

	2007 - 2011 Average	<u> 2012</u>	2013 Proposed
Population:	4,642	3,383	1,920
Harvest:	543	596	950
Hunters:	562	627	1,000
Hunter Success:	97%	95%	95%
Active Licenses:	651	739	1,200
Active License Percent:	83%	81%	79%
Recreation Days:	2,338	2,728	4,000
Days Per Animal:	4.3	4.6	4.2
Males per 100 Females	47	48	
Juveniles per 100 Females	56	57	

Population Objective: 4,800

Management Strategy: Recreational

Percent population is above (+) or below (-) objective: -29.5%

Number of years population has been + or - objective in recent trend: 3

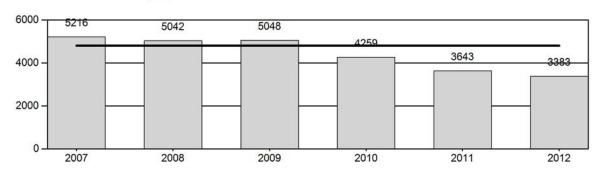
Model Date: 4/11/2013

Proposed harvest rates (percent of pre-season estimate for each sex/age group):

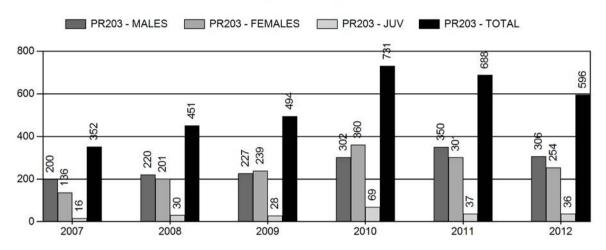
	JCR Year	<u>Proposed</u>	
Females ≥ 1 year old:	13%	33%	
Males ≥ 1 year old:	32%	56%	
Juveniles (< 1 year old):	3%	6%	
Total:	15%	31%	
Proposed change in post-season population:	-6%	-25%	

## **Population Size - Postseason**

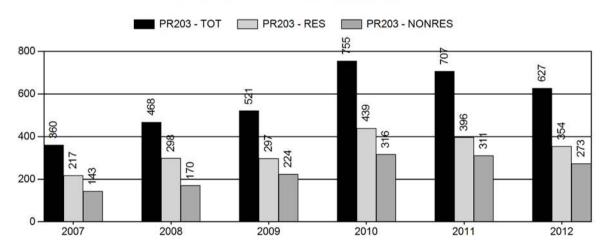
PR203 - POPULATION - PR203 - OBJECTIVE



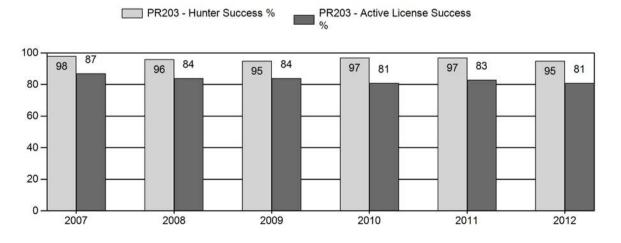
## **Harvest**



### **Number of Hunters**

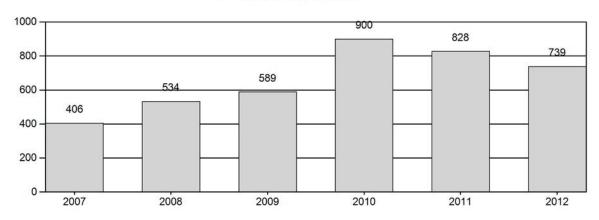


## **Harvest Success**



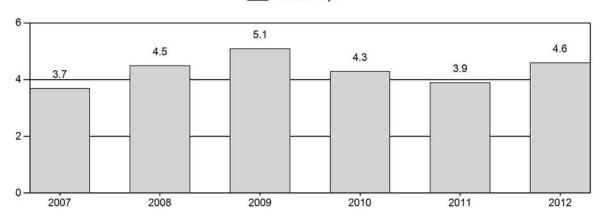
### **Active Licenses**

PR203 - Active Licenses

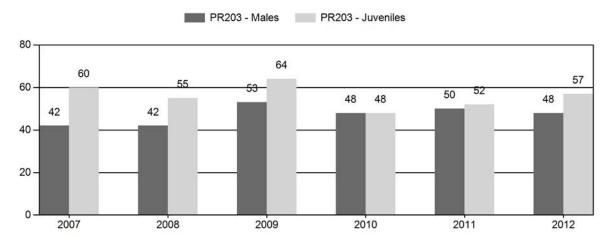


## **Days Per Animal Harvested**

PR203 - Days



# Preseason Animals per 100 Females



#### 2007 - 2012 Preseason Classification Summary

### for Pronghorn Herd PR203 - COPPER MOUNTAIN

			MA	LES		FEMA	ALES	JUVE	NILES			Mal	es to 10	00 Fema	ales	١	oung t	0
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2007	5,604	0	0	350	21%	825	49%	499	30%	1,674	1,525	0	0	42	± 4	60	± 5	42
2008	5,538	0	0	403	21%	969	51%	534	28%	1,906	1,364	0	0	42	± 3	55	± 4	39
2009	5,591	0	0	509	24%	961	46%	613	29%	2,083	1,686	0	0	53	± 4	64	± 4	42
2010	5,063	0	0	358	24%	752	51%	362	25%	1,472	1,172	0	0	48	± 4	48	± 4	33
2011	4,400	0	0	467	25%	928	50%	478	26%	1,873	1,277	0	0	50	± 4	52	± 4	34
2012	4,038	0	326	326	23%	682	49%	391	28%	1,399	1,285	0	48	48	± 4	57	± 5	39

#### 2013 HUNTING SEASONS COPPER MOUNTAIN PRONGHORN HERD (PR203)

Hunt		Dates of S	easons		
Area	Type	Opens	Closes	Quota	Limitations
76	1	Oct. 1	Oct. 31	150	Limited quota; any antelope
	2	Aug. 15	Sep. 30	25	Limited quota; any antelope valid on or within one-half (1/2) mile of irrigated land
	6	Sep. 1	Oct. 31	25	Limited quota; doe or fawn
	7	Aug. 15	Nov. 15	75	Limited quota; doe or fawn valid on or within one-half $(1/2)$ mile of irrigated land
114	1	Oct. 1	Oct. 31	50	Limited quota; any antelope
	2	Aug. 15	Sep. 30	150	Limited quota; any antelope valid on or within one-half (1/2) mile of irrigated land
	6	Aug. 15	Nov. 15	500	Limited quota; doe or fawn valid on or within one-half $(1/2)$ of irrigated land
115	1	Oct. 1	Oct. 31	150	Limited quota; any antelope
	6	Oct. 1	Oct. 31	175	Limited quota; doe or fawn valid in that portion of Area 115 east of the Nowood River or south and west of Cornell Gulch or
					Nowater Stock Trail (BLM Road 1404)
Archery		Aug. 15			Refer to Section 3

Hunt Area	Type	Quota change from 2012
76	1	+25
114	2	+100
	6	+350
Total	1&2	+125
	6	+350

#### **Management Evaluation**

**Current Postseason Population Management Objective:** 4,800

Management Strategy: Recreational

2012 Postseason Population Estimate: 3,400

2013 Proposed Postseason Population Estimate: 2,000

Herd Unit Issues. The current model represents a good reflection of the population and trends, which mirrors that of field personnel perceptions, harvest data and classification numbers. The herd unit is about 70% public lands and 30% private lands. Much of the herd unit is supported by vast areas of cheatgrass. Higher densities of pronghorn occur is the southern portion of herd unit along the upper slopes of Copper Mountain and the upper Nowood area. Pronghorn utilizing the low elevation desert country are at low densities, and in some cases are struggling to maintain current numbers. In summer 2012, significant cropland damage issues occurred in the western

portion of the herd unit, particularly hunt area 114. Poor habitat conditions, long-term drought, and crop damage will and continue to be major management concerns for this herd. The herd objective and management strategy were last revised in 2003.

**Weather.** The winter of 2010/11 was severe enough to have caused significant mortality in this herd. After this winter event, reduced numbers of pronghorn were apparent throughout the herd unit. Since then, winter conditions have been sporadic, with 2011/12 being mostly mild and 2012/13 being slightly severe with persistent snow cover throughout the winter. Overall, annual drought conditions continue to persist, with periodic moisture events occurring during the year. Spring and early summer moisture in 2010 and 2011 was above normal, but 2012 was way below normal. These cyclic weather events for the most part appears to be having mostly negative effects on this herd since overall numbers continue to decline.

**Habitat.** Overall, habitat conditions have declined in this herd unit since the onset of drought in the 1990's. With reduced moisture, spring green-up and annual plant growth has been minimal in most years. Lack of precipitation has also affected available water in many stock reservoirs and perennial streams. Two sagebrush transects were established in this herd unit in September 2004 (Appendix C). Overall, annual production (leader growth) for these transects has average around 2cm. Winter utilization remains low at about 10% for these transects. Until considerable moisture regimes return, herd growth and survival will continue to be adversely affected by reduced habitat conditions caused by drought, and likely higher than needed harvest to reduce damage concerns.

**Field Data.** Both aerial and ground surveys are used in obtaining pre-season classification data for this pronghorn herd. Adequate sample sizes are typically exceeded, mainly because routine classification routes for each hunt area are maintained. The number of pronghorn classified has declined in recent years, from a high of 2,083 pronghorn in 2009 to 1,400 in 2012. However, relative trends for both fawn and buck ratios appear mostly stable over this time period, with a 2012 ratio of 48 bucks and 57 fawns per 100 does. Although buck and fawn ratios remain favorable, the declines in numbers are a concern.

Three line-transect (LT) surveys have been conducted in the herd unit; the first in 2000 with an estimate of 4,600 pronghorn, the second in 2004 with an estimate of 4,000 pronghorn, and the last in 2007 with an estimate of 4,100 pronghorn. These LT estimates are consistent with field personnel perceptions, and track well with model trends and estimates.

**Harvest Data.** Because of increasing pronghorn numbers in the late 2000's, along with increased damage issues, license quotas, hunter number and harvest increased dramatically from 2006 to 2010, but have dropped off slightly since. In fact, between 2006 and 2010, harvest increased by over 130%. Since 2010 harvest dropped by about 19% due to declining numbers and reduced damage concerns. These harvest trends, along with model population estimates and trends are reflective of field personnel perceptions that pronghorn numbers have declined.

**Population.** The constant juvenile & adult survival (CJ, CA) spreadsheet model best represents the long-term population estimate and trends for this herd. This model had the lowest AIC value (n=70), and tracks well with LT estimates, harvest data, and classification numbers. Although

this pronghorn population has shown a decline of 29% since 2009, additional harvest will be proposed for 2013, specifically in area 114, in order to alleviate potential damage concerns. Although the population is currently below objective by 30%, we are anticipating the population to drop to about 2,000 pronghorn post-season 2013, or nearly 60% below objective. The current model is a fair to good representation of this herd.

**Management Summary.** The 2013 season will allow for an increase of 25 Type 1 licenses in area 76, since success and effort have remained favorable. Because of increased damage issues and payments in 2012, area 114 will see an increase of 100 Type 2 licenses and 350 Type 6 licenses, along with an earlier opening date for both Types. No changes to area 115 will occur. The projected 2013 harvest of about 950 pronghorn will continue to drive this population down to an estimated 2013 post-season population of around 2,000 pronghorn.

INPUT	
Species:	Pronghorn
Biologist:	Bart Kroger
Herd Unit & No.:	Herd Unit & No.: Copper Mtn PR203
Model date.	04/41/13

	MODELS SUMMARY	Fit	Relative AICc	Check best model Notes to create report
CJ,CA	Constant Juvenile & Adult Survival	61	70	☑ CJ,CA Model
SCJ,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	62	71	□ SCJ,SCA N
TSJ,CA	Time-Specific Juvenile & Constant Adult Survival	28	132	☐ TSJ,CA Model

	Objective		4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800
	Trend Count																																
	on Estimate	Field SE								999				693			657																
	LT Population Estimate	Field Est								4610				3992			4087																
	r Pop (year i)	Total Adults	4397	4027	3773	4057	4024	4357	4458	4339	4027	3789	3767	3781	3883	4006	4094	3981	3918	3350	2974	2258											
	nd-of-bio-yea	Females	3072	2851	2721	2866	2872	3077	3123	3023	2858	2735	2730	2737	2793	2830	2827	2703	2593	2213	2000	1535											
	Predicted adult End-of-bio-year Pop (year i)	Total Males	1325	1175	1052	1191	1152	1279	1335	1316	1170	1054	1037	1044	1090	1176	1267	1278	1325	1137	974	723											
op Model	Total		5443	4992	4634	5235	4971	5649	5693	5407	4791	4553	4664	4729	4910	5085	5216	5042	5048	4259	3643	3383	1920										
lates from T	n (year i)	Females	3076	2787	2666	2601	2763	2777	2897	2893	2877	2727	2625	2608	2618	2639	2624	2549	2386	2145	1837	1681	954										
Population Estimates from Top Model	Posthunt Population (year i)	<b>Total Males</b>	1162	973	998	797	913	847	896	1045	1056	913	800	782	782	851	933	1000	1003	996	729	618	269										
Pop	Predicted Pos	Juveniles	1205	1232	1103	1836	1294	2025	1828	1468	828	913	1238	1340	1510	1595	1660	1494	1659	1147	1076	1084	269										
	Total		6259	5578	2065	5534	5275	5979	6122	5851	5117	4865	4953	5042	5222	5413	5604	5538	5591	5063	4400	4038	2965										
	tion (year i)	Females	3646	3010	2794	2666	2808	2815	3016	3061	2962	2800	2680	2676	2683	2737	2773	2770	2649	2541	2169	1960	1504										
	Predicted Prehunt Population (year i)	<b>Total Males</b>	1632	1298	1152	1031	1168	1129	1254	1308	1290	1146	1033	1016	1023	1068	1153	1242	1253	1298	1114	954	502										
	Predicted F	Juveniles	1251	1269	1119	1836	1300	2035	1852	1482	865	918	1240	1351	1516	1608	1677	1527	1690	1223	1117	1124	752										
	7007	4	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2002	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	707	2018	2020	2021	2022	2023	2024 2025

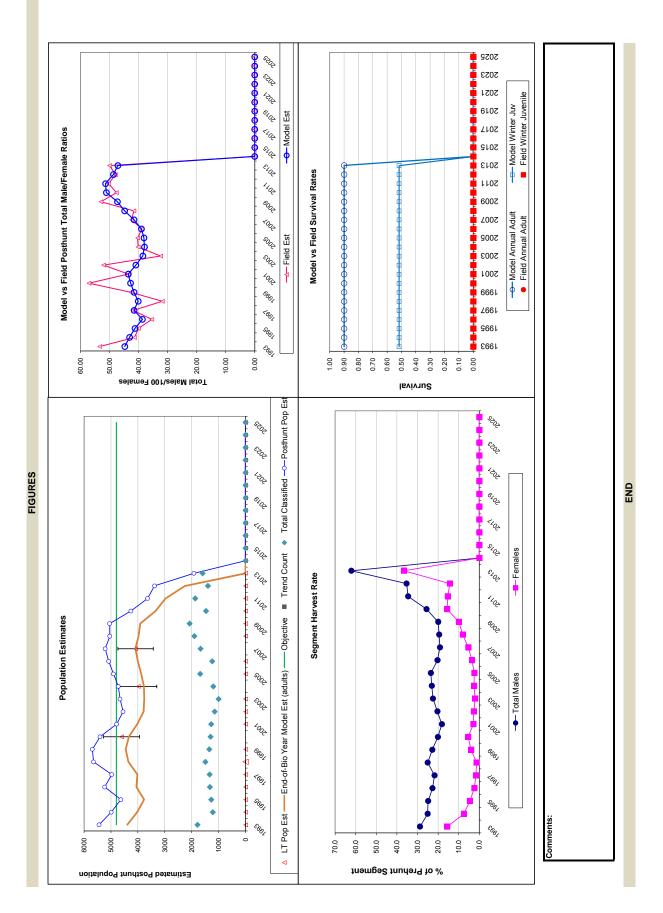
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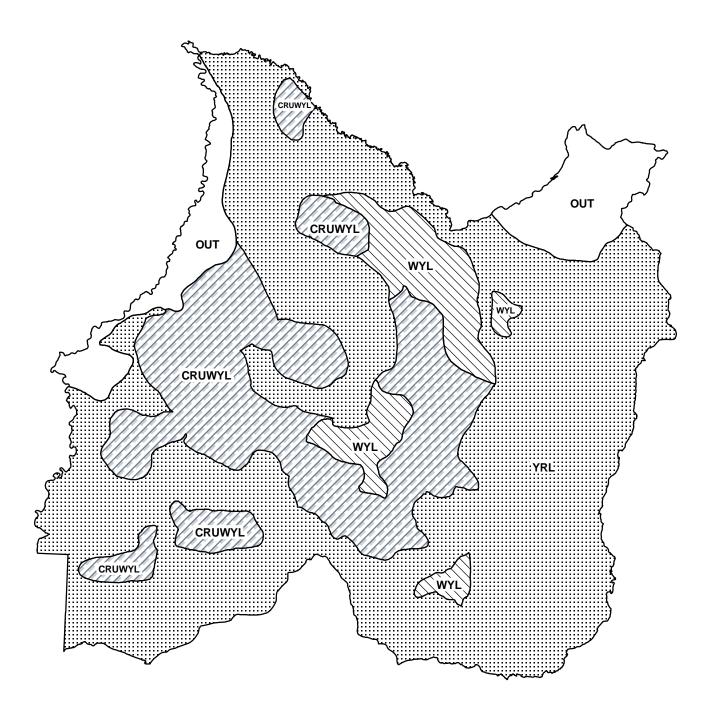
Parameters:	Optim cells
Juvenile Survival =	0.516
Adult Survival =	0.900
Initial Total Male Pop/10,000 =	0.163
Initial Female Pop/10,000 =	0.365

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	%09
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult survival	%80

Populatio																																		
Survival and Initial Populatio		SE																																
Survival	Annual Adult Survival Rates	Field Est																																
	Annna	Model Est	0:00	0.90	0.90	0:00	0.90	0.90	06:0	06:0	06:0	06:0	06:0	06:0	06:0	06:0	06:0	0.00	06:0	0:00	0.90	0.90	0.00											
	Annual Juvenile Survival Rates	Field Est SE																																
	Annual	Model Est	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52											
	700	- 69	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2002	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	9 19	200	9 6	600	202	2022	2023	2024 2025	

	est Rate (% of	Females	15.6	7.4	4.6	2.4	1.6	1.3	3.9	5.5	2.9	2.6	2.1	2.5	2.4	3.6	5.4	8.0	6.6	15.6	15.3	14.3	36.6											
Harvest	Segment Harvest Rate (% of	Total Males	28.8	25.1	24.8	22.7	21.8	25.0	22.8	20.1	18.2	20.3	22.5	23.1	23.5	20.3	19.1	19.5	19.9	25.6	34.6	35.3	62.1											
		Total Harvest	286	533	392	272	277	300	390	404	296	284	263	285	284	298	352	451	494	731	688	596	950											
		Females	518	203	117	29	41	34	108	152	77	29	20	62	29	88	136	201	239	360	301	254	200											
		Males	427	296	260	213	231	257	260	239	213	212	211	213	219	197	200	220	227	302	350	306	400											
		Juv	42	34	15	0	2	o	22	13	9	2	7	10	9	12	16	30	28	69	37	36	20											
		Field SE	2.93	2.97	2.81	2.72	2.89	2.39	3.03	3.76	2.90	3.57	2.76	2.99	2.57	2.93	2.71	2.47	2.90	3.06	2.86	3.23	3.06											
unts	Total Male/Female Ratio	Field Est	53.41	41.42	40.06	35.44	41.91	31.79	42.66	57.10	43.51	52.09	32.38	40.16	40.33	38.85	42.42	41.59	52.97	47.61	50.32	47.95	20.00											
Classification Counts	Total	Derived Est	44.75	43.13	41.21	38.67	41.57	40.12	41.58	42.75	43.54	40.93	38.52	37.97	38.14	39.02	41.57	44.82	47.29	51.09	51.37	48.68	47.13											
C		Field SE	2.20	3.00	2.81	4.23	3.09	4.12	3.87	3.37	2.26	2.65	3.47	3.47	3.21	3.85	3.43	2.97	3.30	3.08	2.90	3.64	3.06											
	Juvenile/Female Ratio	Field Est	34.31	42.17	40.06	68.88	46.27	72.31	61.42	48.42	29.19	32.80	46.26	50.48	56.53	58.76	60.48	55.11	63.79	48.14	51.51	57.33	20.00											
	ηſ	Derived Est																																
		Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2002	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2023	2024	2020





Pronghorn (A203) - Copper Mountain HA 76, 114, 115 Revised 4/2006

### 2012 - JCR Evaluation Form

SPECIES: Pronghorn PERIOD: 6/1/2012 - 5/31/2013

HERD: PR204 - FIFTEENMILE HUNT AREAS: 77, 83, 110

PREPARED BY: BART KROGER

	2007 - 2011 Average	<u>2012</u>	2013 Proposed
Population:	5,180	3,548	2,138
Harvest:	519	741	1,000
Hunters:	490	683	900
Hunter Success:	106%	108%	111%
Active Licenses:	575	830	1,100
Active License Percent:	90%	89%	91%
Recreation Days:	1,630	2,469	3,000
Days Per Animal:	3.1	3.3	3
Males per 100 Females	41	40	
Juveniles per 100 Females	55	43	

Population Objective: 4,600

Management Strategy: Recreational

Percent population is above (+) or below (-) objective: -22.9%

Number of years population has been + or - objective in recent trend: 2

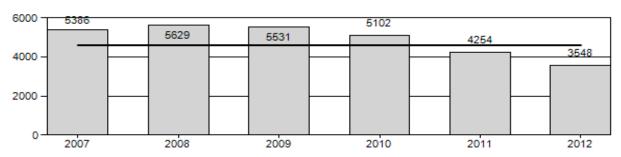
Model Date: 4/11/2013

Proposed harvest rates (percent of pre-season estimate for each sex/age group):

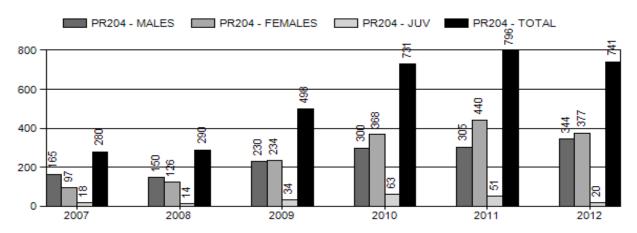
	JCR Year	<b>Proposed</b>
Females ≥ 1 year old:	16%	30%
Males ≥ 1 year old:	35%	58%
Juveniles (< 1 year old):	2%	7%
Total:	17%	31%
Proposed change in post-season population:	-15%	-26%

## Population Size - Postseason

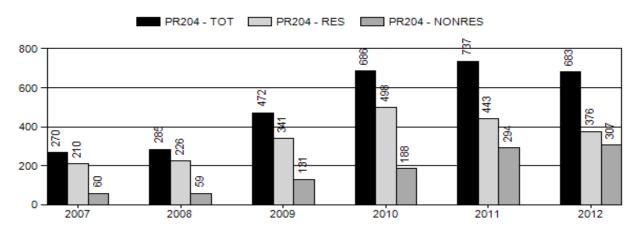
PR204 - POPULATION PR204 - OBJECTIVE



### **Harvest**



## **Number of Hunters**

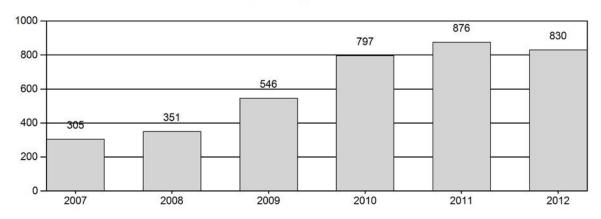


## **Harvest Success**



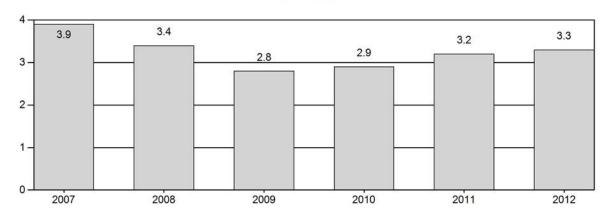
### **Active Licenses**

PR204 - Active Licenses

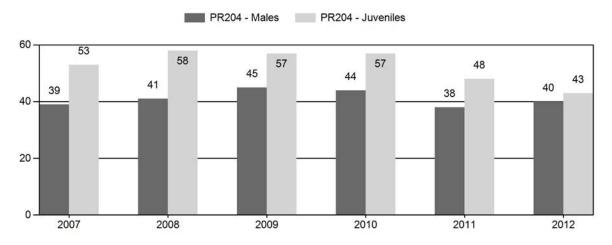


# **Days Per Animal Harvested**

PR204 - Days



# Preseason Animals per 100 Females



#### 2007 - 2012 Preseason Classification Summary

#### for Pronghorn Herd PR204 - FIFTEENMILE

		MALES				FEM/	LES	JUVE	NILES			Mal	es to 10	00 Fema	ales	١	oung t	0
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2007	5,694	0	0	387	20%	999	52%	531	28%	1,917	1,248	0	0	39	± 3	53	± 4	38
2008	5,948	0	0	428	20%	1,053	50%	611	29%	2,092	1,413	0	0	41	± 3	58	± 4	41
2009	6,079	0	0	480	22%	1,069	49%	611	28%	2,160	1,406	0	0	45	± 3	57	± 4	39
2010	5,906	0	0	439	22%	1,008	50%	572	28%	2,019	1,411	0	0	44	± 3	57	± 4	40
2011	5,129	0	0	404	20%	1,060	54%	507	26%	1,971	1,147	0	0	38	± 3	48	± 3	35
2012	4,363	0	362	362	22%	900	55%	389	24%	1,651	971	0	40	40	± 3	43	± 3	31

#### 2013 HUNTING SEASONS FIFTEEN MILE PRONGHORN HERD (PR204)

Hunt		Dates of S	easons		
Area	Type	Opens	Closes	Quota	Limitations
77	1	Sep. 20	Oct. 14	75	Limited quota; any antelope
	2	Aug. 15	Sep. 19	75	Limited quota; any antelope valid on or within one-half (1/2) mile of irrigated land
	6	Aug. 15	Nov. 15	250	Limited quota; doe or fawn valid on or within one-half $(1/2)$ mile of irrigated land
83	1	Sep. 20	Nov. 7	250	Limited quota; any antelope
	6	Aug. 15	Nov. 15	400	Limited quota; doe or fawn valid on or within one-half $(1/2)$ mile of irrigated land
110	1	Sep. 20	Oct. 14	150	Limited quota; any antelope
	6	Sep. 20	Oct. 14	100	Limited quota; doe or fawn
Archery		Aug. 15			Refer to Section 3

Hunt Area	Type	Quota change from 2012						
77	2	+50						
	6	+200						
83	1	+100						
	6	+100						
110	1	-25						
	6	-75						
Total	1&2	+125						
	6	+225						

#### **Management Evaluation**

**Current Postseason Population Management Objective:** 4,600

2012 Postseason Population Estimate: 3,500

**2013 Proposed Postseason Population Estimate: 2,100** 

Herd Unit Issues. Because of dominating drought conditions over the past decade, pronghorn utilizing mostly native ranges are at low densities, whereas those utilizing mostly private (irrigated) areas appear to be striving and are at high densities. This has led to increased damage concerns on some private lands. The current model represents a good reflection of the population and trends, which mirrors that of field personnel perceptions, harvest data and classification numbers. The herd unit is about 75% public lands and 25% private lands, with the majority of pronghorn in the herd unit on or associated with private land. In summer 2012, private crop land damage issues occurred in the eastern portion of the herd unit, particularly hunt area 77 and 83. Poor habitat conditions, long-term drought, and crop damage will and continue to be major management concerns for this herd. The herd objective and management strategy were last revised in 1995.

**Weather.** The winters of 2011-12 and 2012-13 were mild with low snowpack resulting in mostly good over-winter survival. However, the winter of 2010-11 along with the dry spring and summer of 2012 appeared to have been severe enough to cause some die-off and reduced survival. Overall, annual drought conditions continue to persist, with periodic moisture events occurring during the year. Spring and early summer moisture in 2010 and 2011 was above normal, but 2012 was way below normal. These cyclic weather events for the most part appear to be having mostly negative effects on this deer herd, since overall populations numbers continue to decline.

**Habitat.** Overall, habitat conditions have declined in this herd unit since the onset of drought in the 1990's. With reduced moisture, spring green-up and annual plant growth has been minimal in most years. Lack of precipitation has also affected available water in many stock reservoirs and perennial streams. Overall, long-term drought conditions have affected habitat conditions in this herd unit. Most sagebrush communities continue to lack vigor, reproduction, and leader growth. Until considerable moisture regimes return, herd growth and survival will continue to be adversely affected by reduced habitat conditions caused by drought. Three sagebrush transects were established in this herd unit in 2004. Transect locations include 5-mile Creek, Grass Creek and Wagonhound Bench (Appendix B). Annual production of sagebrush (leader growth), continues to average about 2cm. Winter utilization of these three sagebrush transects was similar to slightly below the 6-year average of 10%.

**Field Data.** Aerial preseason classification flights are conducted annually during the month of August in hunt areas 77 and 83, while hunt area 110 classifications are conducted from the ground. On average since about 2007 about 1700-2200 pronghorn are classified, with adequate sample sizes being achieved yearly. The number of pronghorn classified mirrors that of the population model trend in recent years. Relative trends for fawn and buck ratios appear mostly stable over the past 6 years, with only slight annual variations. Buck ratios consistently remain below 40:100 on average, while fawn ratios never exceed 60:100.

Four line-transect (LT) surveys have been conducted in the herd unit since 1999. LT estimates of pronghorn over the past 14 years have been, 2,900 in 1999, 2,800 in 2002, 3,700 in 2006 and 4,600 in 2010. Model estimates are slightly higher than the 1999, 2002 and 2006 LT estimates, whereas the 2010 LT estimate is higher than the model estimate. However, all four LT standard errors (SE) fall within the range of the model estimates. In addition, population trends between the model and LT's are consistent with field personnel perceptions.

**Harvest Data.** Because of increasing pronghorn numbers in the mid to late 2000's, along with increased damage issues, license quotas, hunter number and harvest increased dramatically since 2006. In fact, between 2006 and 2011, total harvest increased by over 300%. These harvest trends, along with model population estimates and trends are reflective of field personnel perceptions that pronghorn numbers have declined dramatically.

**Population.** The constant juvenile & adult survival (CJ, CA) spreadsheet model best represents the long-term population estimate and trend for this herd. This model had the lowest AIC value of 72, and tracks well with field perceptions, LT estimates, harvest data, and classification

numbers. Although this pronghorn population has declined by 28% since 2009, additional harvest will be proposed for 2013, specifically in area 77 and 83 in order to alleviate potential damage concerns. The model is a fair to good representation of this herd.

Management Summary. The 2013 season changes in area 77 and 83 are mainly for addressing damage concerns, while the area 110 changes are to reduce harvest. Herd unit wide, Type 1 or Type 2 license quotas will increase by 125 licenses, while the Type 6 and Type 7 quotas will increase by 225 licenses. Earlier opening dates will accommodate most of these seasons. The reduction in license quotas for area 110 is mainly because of observed declines in pronghorn, and the fact the Pitchfork Ranch has expressed some concern over these declines. The Pitchfork Ranch HMA annually supports nearly 80% of the harvest in area 110. The projected 2013 harvest of about 1000 pronghorn will continue to drive this population down to an estimated 2013 post-season population of around 2,100 pronghorn, or about 55% below objective.

INPUT	
Species:	Pronghorn
Biologist:	Bart Kroger
Herd Unit & No.:	15-Mile, PR204
Model date:	04/11/13

	MODELS SUMMARY	E.	Relative AICc	Check best model Notes to create report
CJ,CA	Constant Juvenile & Adult Survival	63	72	크CJ,CA Model
SCJ,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	64	72	□ SCJ.SCA N
TSJ,CA	Time-Specific Juvenile & Constant Adult Survival	18	119	☐ TSJ,CA Model

	Objective		4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600 4600
	Trend Count																																
	LT Population Estimate	Field SE							860			933				917				1232													
	LT Populat	Field Est							2868			2800				3705				4559													
	ır Pop (year i)	Total Adults	5459	4638	4400	4260	4095	4020	3757	3592	3476	3418	3445	3686	3936	4177	4271	4416	4313	3926	3409	2559											
	End-of-bio-yea	Females	3844	3243	3121	3042	2952	2914	2766	2696	2680	2660	2684	2810	2953	3073	3100	3128	3019	2736	2413	1861											
	Predicted adult End-of-bio-year Pop (year i)	Total Males	1614	1395	1279	1219	1143	1106	066	897	962	758	761	876	982	1103	1171	1288	1294	1190	966	869											
op Model	Total		6671	2806	5456	5440	5180	5139	4603	4375	4115	4072	4188	4668	4977	5293	5386	5629	5531	5102	4254	3548	2138										
nates from T	n (year i)	Females	3737	3102	2964	2832	2772	2716	2664	2595	2617	2589	2580	2622	2754	2860	2905	2899	2808	2554	2197	1950	1219										
Population Estimates from Top Model	Posthunt Population (year i)	Total Males	1391	1161	1051	937	892	838	818	729	999	615	585	614	402	814	006	983	1009	938	831	298	244										
Pop	Predicted Pos	Juveniles	1543	1543	1441	1670	1517	1584	1120	1052	833	869	1023	1432	1515	1619	1581	1747	1715	1610	1226	1000	675										
	Total		7875	6926	2009	5999	5713	5619	5089	4745	4356	4275	4375	4808	5127	5481	5694	5948	6009	2906	5129	4363	3238										
	tion (year i)	Females	4485	3767	3178	3059	2981	2893	2856	2711	2642	2626	2607	2630	2754	2894	3012	3038	3065	2959	2681	2364	1824										
	Predicted Prehunt Population (year i)	Total Males	1807	1582	1367	1253	1194	1120	1084	971	879	780	743	746	828	963	1081	1148	1262	1268	1166	226	684										
	Predicted F	Juveniles	1584	1576	1462	1687	1538	1606	1149	1064	836	869	1025	1432	1515	1624	1601	1763	1752	1679	1282	1022	730										
	Vear	9	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2002	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	5 6	2010	2020	2021	2022	2023	2024 2025

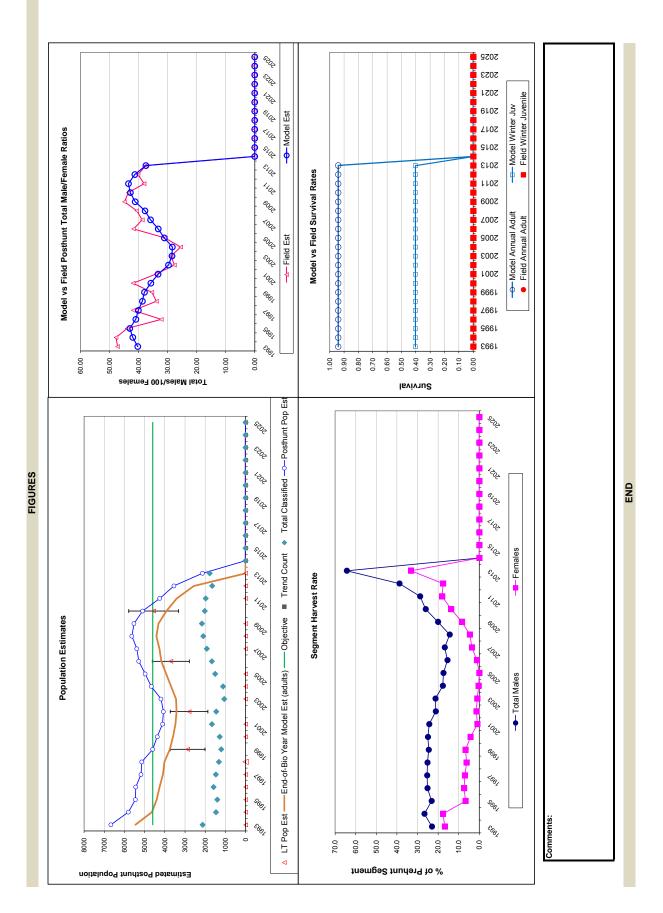
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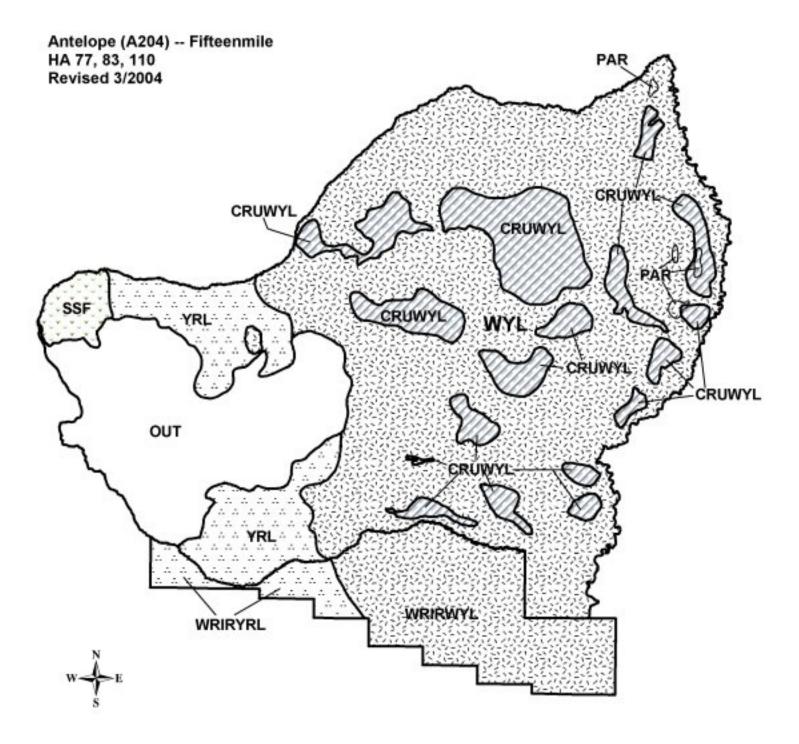
Parameters:	Optim cells
Juvenile Survival =	0.403
Adult Survival =	0.940
Initial Total Male Pop/10,000 =	0.181
Initial Female Pop/10,000 =	0.448

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	%09
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult survival	%86

Popula																																		
Survival and Initial Popula		SE																																
Survival	Annual Adult Survival Rates	Field Est																																
	Annua	Model Est	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94											
	Annual Juvenile Survival Rates	Field Est SE																																
	Annua	Model Est	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40											
	Voar	Gal	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2002	2006	2007	2008	2009	2010	2011	2012	2013	2014	2012	2016	2017	2018	2019	2020	2021	2022	2024	2025

	st Rate (% of	Females	16.7	17.7	6.7	7.4	7.0	6.1	6.7	4.3	6.0	1.4	1.0	0.3	0.0	1.2	3.5	4.6	8.4	13.7	18.1	17.5	33.2										
Harvest	Segment Harvest Rate (% of	Total Males	23.0	26.6	23.2	25.2	25.3	25.1	24.6	24.9	24.3	21.2	21.3	17.7	17.4	15.4	16.8	14.4	20.0	26.0	28.8	38.7	64.3										
		Total Harvest	1095	1018	501	208	484	437	442	336	219	184	170	127	136	171	280	290	498	731	962	741	1000										
		Females	089	605	194	206	190	161	174	105	22	34	24	7	0	31	26	126	234	368	440	377	550										
		Males	378	383	288	287	275	256	242	220	194	150	144	120	136	135	165	150	230	300	305	344	400										
		Juv	37	30	19	15	19	20	26	7	က	0	2	0	0	2	18	4	34	63	51	20	20										
	_	Field SE	2.44	3.03	2.93	2.24	2.79	2.55	2.64	2.90	2.13	1.98	2.43	2.28	2.24	2.65	2:32	2.33	2.47	2.49	2.23	2.50	2.27										
ounts	Total Male/Female Ratio	Field Est	47.25	47.80	43.96	32.19	41.84	33.86	35.42	41.93	34.03	27.65	28.82	25.53	30.90	41.76	38.74	40.65	44.90	43.55	38.11	40.22	37.50										
Classification Counts	Total	Derived Est	40.29	41.99	43.03	40.97	40.07	38.71	37.97	35.80	33.27	29.69	28.51	28.37	31.16	33.26	35.90	37.79	41.17	42.86	43.50	41.30	37.51										
O	Ratio	Field SE	2.03	2.77	3.02	3.18	3.21	3.52	2.87	2.78	2.04	2.21	2.95	3.69	3.25	3.22	2.85	2.95	2.90	2.97	2.58	2.62	2.37										
	Juvenile/Female Ratio	Field Est	35.31	41.84	46.00	55.15	51.58	55.52	40.23	39.24	31.64	33.08	39.33	54.44	55.01	56.11	53.15	58.02	57.16	56.75	47.83	43.22	40.00										
	λης	Derived Est																															
		Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2002	2006	2002	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2023	2024 2025





#### 2012 - JCR Evaluation Form

SPECIES: Pronghorn PERIOD: 6/1/2012 - 5/31/2013

HERD: PR205 - CARTER MOUNTAIN

HUNT AREAS: 78, 81-82 PREPARED BY: TOM EASTERLY

	2007 - 2011 Average	<u>2012</u>	2013 Proposed
Population:	6,880	6,200	6,200
Harvest:	416	701	730
Hunters:	406	673	700
Hunter Success:	102%	104%	104%
Active Licenses:	467	816	950
Active License Percent:	89%	86%	77%
Recreation Days:	1,563	2,377	2,500
Days Per Animal:	3.8	3.4	3.4
Males per 100 Females	49	58	
Juveniles per 100 Females	51	44	

Population Objective: 7,000

Management Strategy: Recreational

Percent population is above (+) or below (-) objective: -11.4%

Number of years population has been + or - objective in recent trend: 2

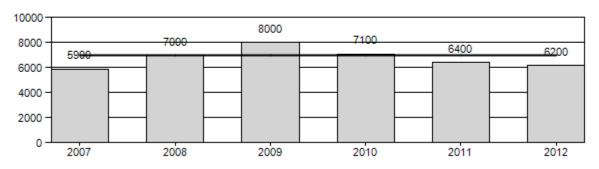
Model Date: 2/7/2013

Proposed harvest rates (percent of pre-season estimate for each sex/age group):

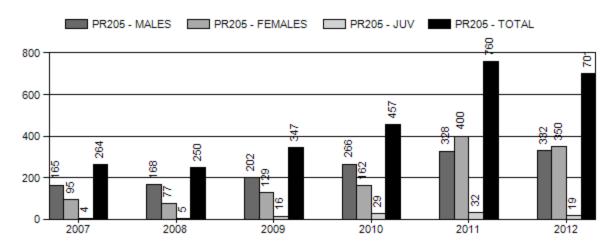
	JCR Year	Proposed
Females ≥ 1 year old:	5.8%	15%
Males ≥ 1 year old:	11.0%	20%
Juveniles (< 1 year old):	0.8%	1.5%
Total:	6.2%	12%
Proposed change in post-season population:	6.2%	12%

## Population Size - Postseason

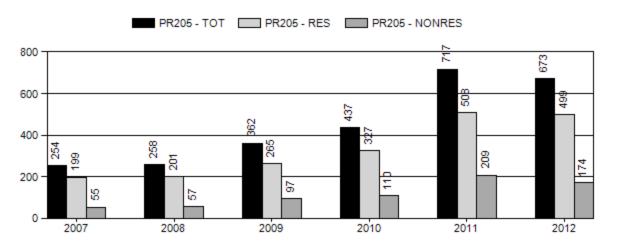
PR205 - POPULATION PR205 - OBJECTIVE



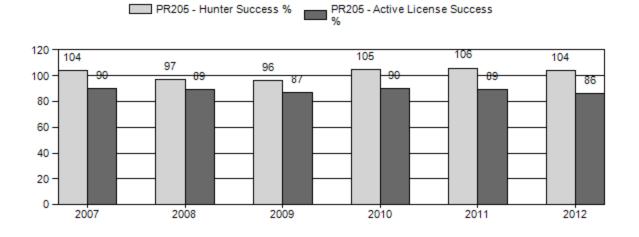
### **Harvest**



## **Number of Hunters**

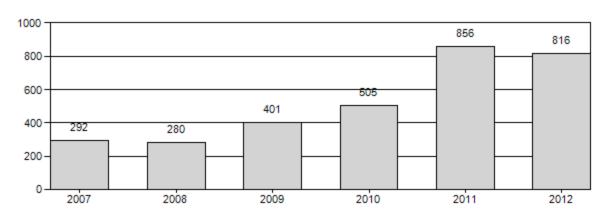


## **Harvest Success**



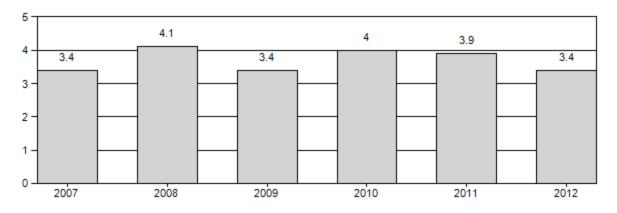
### **Active Licenses**

PR205 - Active Licenses

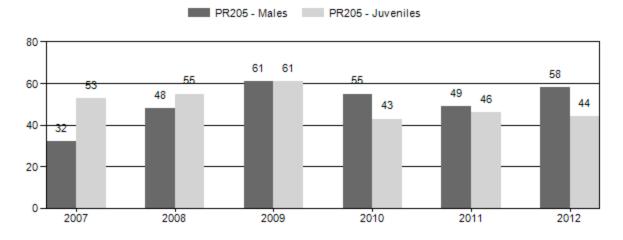


# **Days Per Animal Harvested**

PR205 - Days



# Preseason Animals per 100 Females



#### 2007 - 2012 Preseason Classification Summary

for Pronghorn Herd PR205 - CARTER MOUNTAIN

			MA	LES		FEMA	LES	JUVEN	ILES			Ма	les to 10	00 Fema	les	,	Young t	o
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	YIng	Adult	Total	Cont Int	100 Fem	Cont Int	100 Adult
2007	6,200	110	174	284	17%	895	54%	475	29%	1,654	1,243	12	19	32	±3	53	± 4	40
2008	7,300	161	264	425	24%	880	49%	485	27%	1,790	1,870	18	30	48	± 4	55	± 4	37
2009	8,400	156	273	568	28%	925	45%	568	28%	2,061	1,634	17	30	61	±5	61	± 5	38
2010	7,600	198	410	608	28%	1,098	50%	473	22%	2,179	1,344	18	37	55	±4	43	± 3	28
2011	7,200	115	367	482	25%	992	51%	458	24%	1,932	1,980	12	37	49	±4	46	± 4	31
2012	7,000	125	365	490	29%	844	50%	370	22%	1,704	1,557	15	43	58	±5	44	± 4	28

#### 2012 Preseason Classification by Hunt Area

for Pronghorn Herd PR205 - CARTER MOUNTAIN - Hunt Area ALL

Area	Males				Females		Juveniles			Cls	Males/100			Young/100	
	Ylg	Adult	Total	%	#	%	#	%	Total	Obj	Ylg	Adult	Males	Female	Adult
78	29	95	124	25%	246	50%	125	25%	495		12	39	50	51	34
81	38	124	162	34%	228	48%	81	17%	471		17	54	71	36	21
82	58	146	204	28%	370	50%	164	22%	738		16	39	55	44	29
Total	125	365	490	29%	844	50%	370	22%	1,704	1,557	15	43	58	44	28

**2012 Harvest Data**for Pronghorn Herd PR205 – CARTER MOUNTAIN

								Days/		Licenses
Area	Type	Active Lic/Htrs	Buck	Doe	Fawn	Total	Success	Harvest	Days	Sold
78 McCULLO	UGH PEAK	S								
Type 1		118	113	0	0	113	95.8%	2.8	312	127
Тур	e 6	51	0	43	4	47	92.2%	2.4	114	51
Type 7		219	0	167	8	175	79.9%	3.7	640	250
Pooled Total		329 (388)*	113	210	12	335	101.8% (86.3%)*	3.2	1066	
Pooled Resident		236	86	134	8	228	96.6%	3.5	809	
Pooled Nonr	esident	93	27	76	4	107	115.1%	2.4	257	
81 SOUTH FORK										
Тур	e 1	25	18	2	0	20	80.0%	5.4	108	25
Тур	e 2	97	85	3	0	88	90.7%	4.2	374	104
Тур	e 6	42	0	26	2	28	66.7%	4.6	130	51
Pooled Total		147 (164)*	103	31	2	136	92.5% (82.9%)*	4.5	612	
Pooled Resid	lent	123	83	31	2	116	94.3%	4.9	564	
Pooled Nonr	esident	24	20	0	0	20	83.3%	2.4	48	
82 NORTH GREYBULL RIVER										
Тур	e 1	141	116	0	0	116	82.3%	3.8	441	151
Тур	e 6	34	0	27	3	30	88.2%	3.3	99	50
Тур	e 7	89	0	82	2	84	94.4%	1.9	159	99
Pooled Total		212 (264)*	116	109	5	230	108.5% (87.1%)*	3	699	
Pooled Resid	lent	148	89	44	5	138	93.2%	3.4	464	
Pooled Nonr	esident	64	27	65	0	92	143.8%	2.6	235	
2012 Hunt A	rea Total	688 (816)*	332	350	19	701	101.9% (85.9%)*	3.4	2377	908
2012 Herd T	otal	673 (816)*	332	350	19	701	104.2% (85.9%)*	3.4	2377	908

<sup>\*</sup>Active Licenses

# 2013 HUNTING SEASONS Carter Mountain Pronghorn Antelope Herd Unit (PR205)

Hunt		Date	es of Seasons		
Area	Type	Opens	Closes	Quota	Limitations
78	1	Sep. 20	Oct. 31	125	Limited quota; any antelope
	6	Sep. 1	Nov 30	75	Limited quota; doe or fawn on or within one-half (½) mile of irrigated land
	7	Sep. 1	Nov. 30	250	Limited quota; doe or fawn valid in the Shoshone River drainage
81	1	Oct. 1	Nov. 15	125	Limited quota; any antelope
	6	Oct. 1	Nov. 15	50	Limited quota; doe or fawn valid west of Wyoming Highway 120
82	1	Sep. 20	Oct. 14	150	Limited quota; any antelope
	6	Aug. 15	Oct. 31	50	Limited quota; doe or fawn valid on or within one-half (½) mile of irrigated land east of Wyoming Highway 120
	7	Sep. 20	Oct. 14	75	Limited quota; doe or fawn valid west of Wyoming Highway 120
	8	Oct. 15	Nov. 30	50	Limited quota; doe or fawn valid in Big Horn County
<b>Archery:</b> 78, 81, 82		Aug. 15			Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2012
78	6	+25
81	1	+100
	2	-100
82	7	-25
	8	+50
Total	1	+100
	2	-100
	6	+25
	7	-25
	8	+50

#### **Management Evaluation**

Current Management Objective: 7,000 2012 Postseason Population Estimate: 6,200

2013 Proposed Postseason Population Estimate: 6,200

**Herd Unit Issues.** Carter Mountain pronghorn herd unit has been managed under recreational management with a post-season population objective of 7,000 antelope since 1984. That population goal was reviewed in 2002 and 2007.

Anthropomorphic factors are probably having only a slight influence on survival and productivity of this herd, but probably not to any great extent due to the overall size of the herd unit. There is one major oil/gas field (Oregon Basin) and many wells scattered across the herd unit. Two major highways bisect the herd unit (US Highway 14-16-20 and Wyoming Highway 120) that may be affecting migration routes. Urban expansion is a concern in Area 81 near Cody and the South Fork Highway. Grazing levels (cattle and feral horses) may be affecting herbaceous vegetation which would probably only affect spring/summer forage for antelope.

**Weather.** Drought is the most important factor influencing survival and productivity of this antelope herd. Drought conditions occurred in 2000-04 and 2012. Conditions in 2012 were warmer than average with total precipitation 4-5 inches below average.

**Habitat.** Habitat quality is probably most affected by desert-like conditions (< 12" annual precipitation) and poor soils. Both of those factors have allowed cheatgrass to invade and dominate some sites. Affects of drought on upland vegetation resulted in a shift of antelope to agricultural fields, especially along the Shoshone River in Area 78. Landowners have a low tolerance of antelope. In response, the number of doe/fawn licenses has been increased throughout the herd unit.

With only one sagebrush browse transect established in this herd unit, data is insufficient to draw any inferences across the entire herd unit. The transect near Oregon Basin was established in 2004. This single transect has been of limited utility in gauging browsing levels since production has been limited, even in non-drought years. Utilization of sagebrush along the transect has ranged from <5% to 25% (2005-2011). Weather (snow) probably determines how many antelope concentrate near this site to a great extent.

**Field Data.** Affects of drought on this population were also evident in classification and harvest data. Low fawn:doe ratios were observed during drought years. The 15-year (1985-1999) average was 54 fawns:100 does; during drought fawn:doe ratios were 36:100 (2000-04 average) and 44:100 (2012). Productivity in this herd is lower than other herds across Wyoming.

Buck:doe ratios reflected low productivity and declined during drought years (to 26:100 in 2004). Buck ratios have been increasing since 2004, peaking at 61:100 in 2009 and ranging between 49 (in 2011) and 58:100 does (in 2012). Total number of antelope classified also suggested lower populations during drought years. The 15-year (1985-1999) average number of antelope observed was 2,145; between 2000-06 an average of 1,485 (range 1411-1616) were surveyed. Since 2007, the number of antelope surveyed has increased, peaking at 2,179 in 2011 and has decreased steadily in the past two years (to 1,700 in 2012). Standardized survey routes were established in 2001.

**Harvest Data.** The number of hunting licenses and active hunters decreased as the declining population was detected. After drought, the number of licenses has been slowly increased. In response to increasing number of complaints of crop depredation in 2010, the number of hunting licenses, especially doe/fawn licenses, was increased. Total recreation days began declining in

2001 to 2006, and then began increasing. Similarly, days per harvested animal increased then declined in 2005 and 2006. Days per harvest between 2007-12 have fluctuated, averaging 3.7 days (± 0.3). Hunter success typically does not fluctuate greatly; however, a decline was noted during drought. Prior to 2000, average success was 87% (range 80-90%); during drought (2000-05) success averaged 84% (range 78-90%); and following the extended drought, success increased back to 88% (87-90%). Hunting statistics do reflect population levels but may also be influenced by number of licenses issued.

**Population.** For many years, WGFD used POP-II software to estimate populations of big game species. We have recently changed to spreadsheet models in hopes to more accurately predict changes in populations. Spreadsheet models produced population estimates completely different from POP-II. Thus the old population objective may no longer be valid. It will take much effort to educate the various publics about differences between the two population estimating techniques, which become more confusing when line transect estimates are included. For the Carter Mountain herd unit, we will be using the Time-Specific Juvenile/Constant Adult (TSJ,CA) survival model. This model more closely estimated the population trend as observed by field personnel, and resembles estimates/trends provided by POP-II.

For post-season 2012, the TSJ,CA model estimated 6,200 antelope. The trend in the population estimate reflects affects of drought in the early 2000s and an increase in numbers following drought. The population was estimated to have peaked in 2009 at 8000 antelope. Winter of 2010-11 and drought of 2012, along with increased number of doe/fawn licenses, began a downward trend in the population.

Unfortunately, line transect surveys conducted in 2006 and 2009 estimated the population much higher than what the POP-II models, TSJ,CA model, line transect estimates from 2000 and 2003, and field personnel predicted. Line transect surveys in 2006 and 2009 used a single observer while similar surveys in 2000 and 2003 used two observers. Use of a single observer significantly changed the calculations performed on the line transect data, resulting in estimates that were 2-3 times higher than previous estimates (10,000-12,000 antelope). Personnel feel there has never been 10,000 antelope in this herd unit. There will be another line transect survey conducted in the spring 2013. The survey will be redesigned to fly transects across varying densities of antelope (dense and sparse) rather than across sparse areas then dense areas (as has been done in all past surveys).

**Management Summary.** Although the population estimate is below objective, the hunting seasons proposed for 2013 will further decrease the population. Levels of crop depredation have been unacceptable to landowners and the level of reimbursement for that damage has been unacceptable to WGFD personnel. If/when upland habitat recovers from drought and antelope no longer use cropland, we will be able to increase the herd toward objective. We will be reviewing the population objective and management goals for this herd unit in 2014.

Notes Check best model to create report CJ,CA Model
SCJ,SCA Mod
TSJ,CA Model Relative AICc 128 120 229 119 100 116 Ë Constant Juvenile & Adult Survival Semi-Constant Juvenile & Semi-Constant Adult Survival Time-Specific Juvenile & Constant Adult Survival **MODELS SUMMARY** CJ,CA SCJ,SCA TSJ,CA

Clear form

	Objective		2000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000										
	<b>Trend Count</b>																																	
	n Estimate	Field SE														1889			2500															
	LT Population Estimate	Field Est								4906			2554			9433			12008															
	r Pop (year i)	Females Total Adults	6196	2666	5173	5450	2038	5148	5399	4895	4412	3978	3745	3633	4421	4564	5394	6139	6116	2669	5618	4860	3880	2868										
	nd-of-bio-yea	Females .	4288	4032	3817	3917	3632	3624	3685	3429	3246	3096	3014	2939	3292	3313	3665	3991	3929	3676	3554	3061	2508	1946										
	Predicted adult End-of-bio-year Pop (year i)	Total Males	1908	1634	1356	1533	1406	1524	1714	1467	1166	882	731	969	1130	1251	1730	2148	2187	1992	2063	1798	1372	922										
op Model	Total		7620	7294	0299	7103	6543	6158	6023	6215	5361	4936	4778	4613	4831	6061	2006	0669	8037	7150	6382	6256	5472	3890	2612									
lates from T	n (year i)	Females	4402	4002	3793	3561	3603	3304	3267	3436	3331	3150	3021	2947	2876	3186	3143	3507	3770	3672	3163	3095	2560	1908	1357									
Population Estimates from Top Model	Posthunt Population (year i	Total Males	1826	1419	1146	983	1188	1028	1130	1320	1101	922	292	524	237	953	1044	1510	1883	1851	1592	1658	1399	794	354									
Pop	Predicted Pos	Juveniles	1392	1874	1731	2558	1753	1825	1627	1458	928	1009	1191	1143	1419	1922	1719	1974	2384	1627	1628	1503	1513	1188	901									
	Total		8452	7963	7295	7627	7127	0629	6711	6771	5726	5333	2096	4813	4979	6258	6196	7265	8418	7652	7218	7032	6303	5023	3745									
	tion (year i)	Females	4737	4202	3951	3741	3839	3559	3552	3611	3360	3181	3034	2953	2880	3226	3247	3591	3912	3850	3603	3483	3000	2458	1907									
	Predicted Prehunt Population (year i)	Total Males	2308	1870	1601	1329	1502	1378	1494	1680	1437	1143	864	716	681	1107	1226	1695	2105	2144	1952	2022	1762	1344	904									
	Predicted F	Juveniles	1407	1891	1742	2558	1786	1853	1665	1480	928	1009	1198	1143	1419	1925	1723	1979	2402	1659	1663	1527	1540	1221	934									
	2007	rear	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2002	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2024	2025

ates	
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Populati	
nd Initial	
Survival and Initial Population E	
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Survival and initial Population Estimates			Parameters:		Adult Survival =	Initial Total Male Pop/10,000 =	Initial Female Pop/10,000 =			MODEL ASSUMPTIONS	Sex Ratio (% Males) =	Wounding Loss (total males) =	Wounding Loss (females) =	Wounding Loss (juveniles) =	Over-summer adult surviva										
i and initial		SE																							
SULVIVA	Annual Adult Survival Rates	Field Est																							
	Annua	Model Est	06.0	0.90	06.0	06:0	06.0	06.0	06.0	06.0	0.90	06.0	06.0	06.0	06.0	0.90	06:0	06.0	06.0	0.90	06.0	06.0	0.90	0.90	0.90

0.900 0.231 0.474

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	20%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult surviva	%86

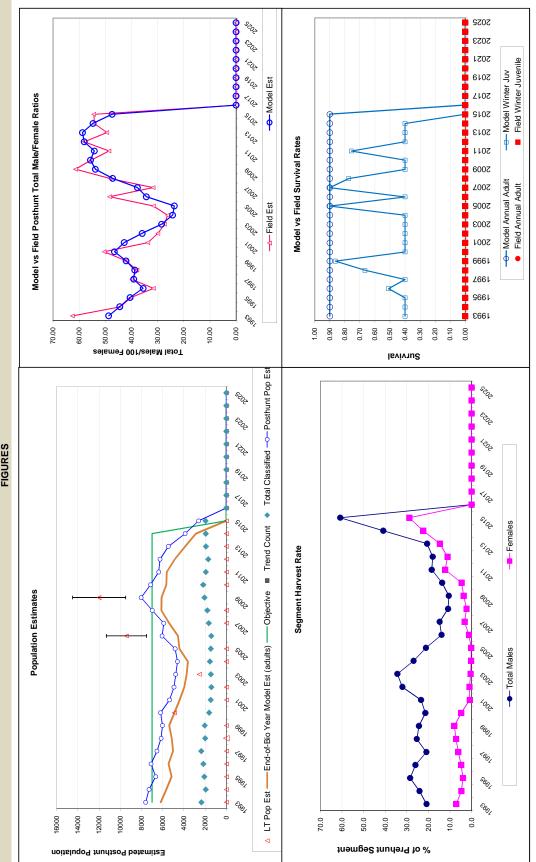
Annual Juvenile Survival Rates

Annual Juvenile States

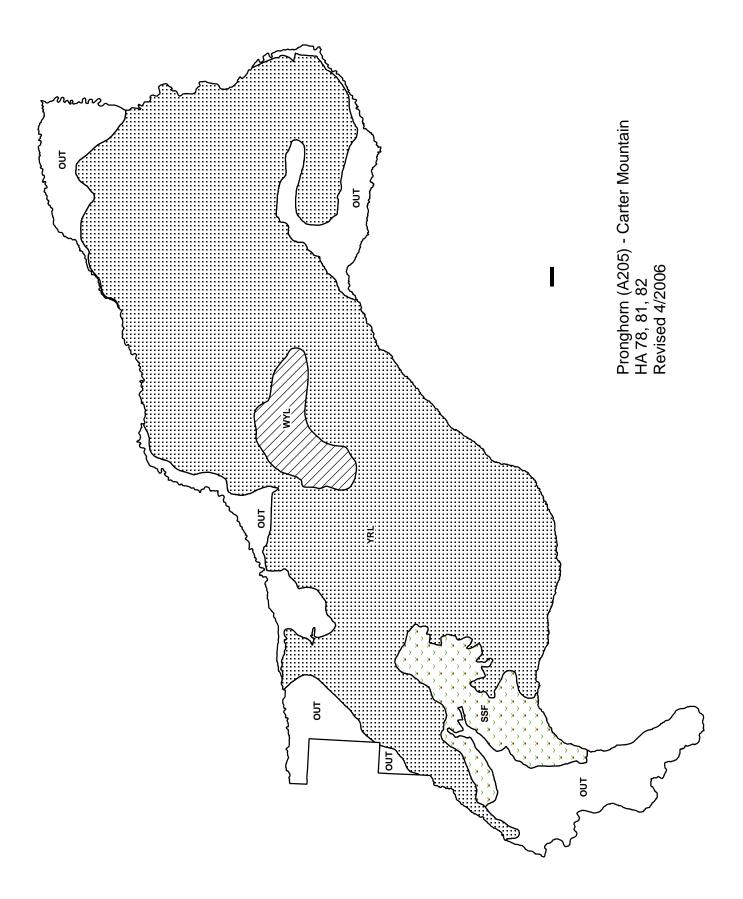
Annual Juvenile Survival Rates

Both

	t Rate (% of	Females	7.1	4.8	4.0	4.8	6.2	7.2	8.0	4.8	6.0	1.0	0.4	0.2	0.2	1.2	3.2	2.4	3.6	4.6	12.2	11.1	14.7	22.4	28.8								
Harvest	Segment Harvest Rate (% of	Total Males	20.9	24.1	28.4	26.0	20.9	25.4	24.4	21.4	23.4	32.1	34.4	26.9	21.2	13.9	14.8	10.9	10.6	13.6	18.5	18.0	20.6	40.9	8.09								
		Total Harvest	226	809	568	477	531	575	625	206	332	361	289	181	135	179	264	250	347	457	200	200	755	1030	1030								
		Juv	13	16	10	0	30	25	35	20	0	0	7	0	0	က	4	2	16	29	32	22	25	30	30								
		Females	305	182	144	163	215	232	259	159	26	28	12	9	4	36	92	77	129	162	400	353	400	200	200								
		Males	438	410	414	314	286	318	331	327	306	333	270	175	131	140	165	168	202	266	328	331	330	200	200								
	io	Field SE	2.89	2.50	2.24	1.96	2.10	2.23	2.36	3.00	2.23	2.11	2.00	1.88	2.27	3.24	2.16	2.85	3.27	2.80	2.70	3.30	2.78	2.97	2.95								
ounts	Total Male/Female Ratio	Field Est	62.29	44.23	40.20	31.61	39.87	37.94	42.06	50.47	33.77	29.90	27.40	26.23	31.60	48.39	31.73	48.30	61.41	55.37	48.59	58.06	49.42	54.29	54.42								
Classification Counts	Total	Derived Est	48.73	44.50	40.53	35.52	39.13	38.72	42.06	46.52	42.77	35.92	28.47	24.26	23.64	34.32	37.75	47.20	53.81	55.68	54.20	58.06	58.74	54.68	47.41								
	Ratio	Field SE	1.78	2.53	2.37	3.26	2.32	2.75	2.53	2.62	1.97	2.19	2.51	2.39	3.01	3.74	3.01	3.12	3.27	2.37	2.61	2.73	2.85	2.80	2.75								
	Juvenile/Female Ratio	t Field Est	29.70	45.01	44.10	68.39	46.52	52.05	46.89	41.00	27.63	31.73	39.50	38.70	49.26	29.68	53.07	55.11	61.41	43.08	46.17	43.84	51.34	49.67	49.01								
		Year Derived Est	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015 2016	2017	2018	2019	2020	2021	2023	2024	2025







### 2012 - JCR Evaluation Form

SPECIES: Pronghorn PERIOD: 6/1/2012 - 5/31/2013

HERD: PR207 - BADGER BASIN

HUNT AREAS: 80 PREPARED BY: DOUG

**MCWHIRTER** 

	2007 - 2011 Average	<u>2012</u>	2013 Proposed
Population:	1,200	850	850
Harvest:	245	153	130
Hunters:	238	166	150
Hunter Success:	103%	92%	87%
Active Licenses:	284	201	175
Active License Percent:	86%	76%	74%
Recreation Days:	1,043	845	800
Days Per Animal:	4.3	5.5	6.2
Males per 100 Females	53	39	
Juveniles per 100 Females	35	30	

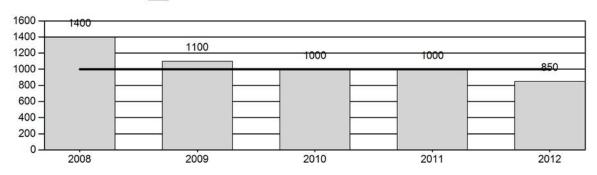
Population Objective:	1,000
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-15%
Number of years population has been + or - objective in recent trend:	3
Model Date:	2/26/2013

Proposed harvest rates (percent of pre-season estimate for each sex/age group):

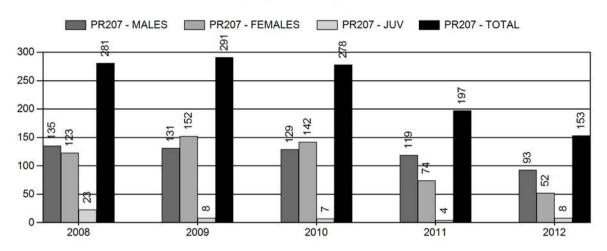
	JCR Year	<u>Proposed</u>
Females ≥ 1 year old:	8.5%	9.7%
Males ≥ 1 year old:	33.6%	35.9%
Juveniles (< 1 year old):	2.1%	1.0%
Total:	13.74%	13.34%
Proposed change in post-season population:	-0.1%	-3.59%

## Population Size - Postseason

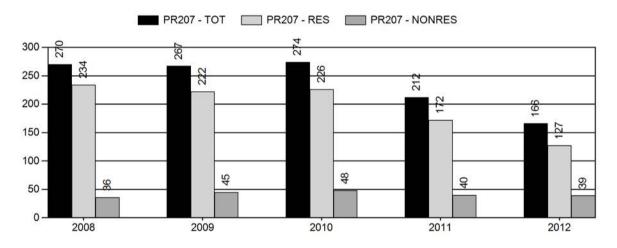
PR207 - POPULATION PR207 - OBJECTIVE



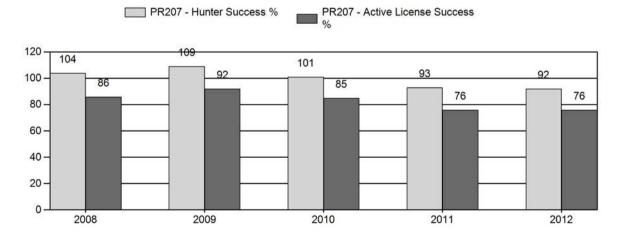
### **Harvest**



### **Number of Hunters**

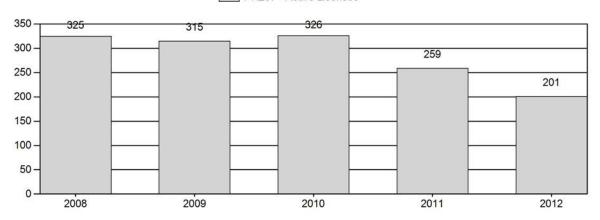


### **Harvest Success**



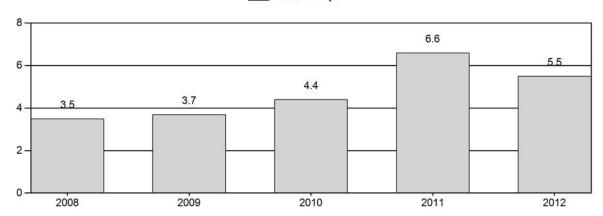
### **Active Licenses**

PR207 - Active Licenses

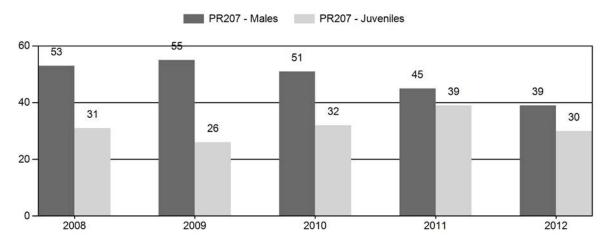


## **Days Per Animal Harvested**

PR207 - Days



## Preseason Animals per 100 Females



### 2007 - 2012 Preseason Classification Summary

### for Pronghorn Herd PR207 - BADGER BASIN

			MAI	LES		FEMA	ALES	JUVEI	VILES				Males Fem	to 100 ales		Y	oung t	to
															Conf			
										Tot	Cls					100	Conf	100
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Cls	Obj	YIng	Adult	Total	Int	Fem	Int	Adult
2007	1,764	74	108	182	28%	312	47%	164	25%	658	812	24	35	58	± 6	53	± 6	33
2008	1,703	82	152	234	29%	442	54%	137	17%	813	685	19	34	53	± 0	31	± 0	20
2009	1,476	56	122	178	31%	321	55%	83	14%	582	784	17	38	55	± 6	26	± 4	17
2010	1,300	58	157	215	28%	419	55%	132	17%	766	617	14	37	51	± 0	32	± 0	21
2011	1,182	15	92	107	25%	236	54%	92	21%	435	612	6	39	45	± 7	39	± 6	27
2012	1,032	37	73	110	23%	283	59%	85	18%	478	515	13	26	39	± 5	30	± 4	22

#### 2013 HUNTING SEASONS BADGER BASIN PRONGHORN HERD (PR207)

Hunt		<b>Dates of Se</b>	asons		
Area	Type	Opens	Closes	Quota	Limitations
80	1	Sept. 1	Sept. 30	100	Limited quota; any antelope
	6	Sept. 1	Sep. 30	25	Limited quota; doe or fawn
	7	Sept. 1	Oct. 31	50	Limited quota; doe or fawn valid in that portion of Area 80 in the Shoshone River drainage
Archery		Aug. 15	Aug. 31		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2012
80	1	-25
	6	-25
	7	+25
Total	1	-25
	6	-25
	7	+25

#### **Management Evaluation**

**Current Postseason Population Management Objective: 1,000** 

**Management Strategy: Recreational** 

2012 Postseason Population Estimate: ~850

2013 Proposed Postseason Population Estimate: ~850

**Herd Unit Issues.** Much of the Badger Basin Herd Unit consists of extremely arid habitats, with low antelope densities that exhibit poor productivity. These areas are interspersed with irrigated lands that are characterized by higher levels of productivity. As a result, damage to irrigated lands is often a problem in this herd unit, especially in drought periods. However, winters are relatively mild and survival is presumably good in most years.

**Weather.** Weather conditions during the 2012 biological year were characterized by little spring moisture, with many areas exhibiting little to no greenup. As a result, damage issues continued to be significant in some locations. Winter conditions were relatively mild, with little snowfall and few extended periods of extremely cold temperatures.

**Habitat.** No habitat monitoring data is collected in this herd unit. Minimal precipitation and presumably poor forage conditions contributed to poor fawn recruitment, but still created damage situations on specific irrigated private lands.

**Field Data.** Preseason classifications in 2012 yielded a fawn ratio of 30 fawns:100 does, and a total buck ratio of 39 bucks:100 does. The poor productivity exhibited by this herd (especially in drought periods) is reflected in the fact that in the last 20 years, fawn:doe ratios have only exceeded 50:00 3 times (1996, 2005, 2007). The 20-year (1993-2012) average fawn:doe ratio is only 37.4 fawns:100 does. Buck ratios increased as the population grew from 2002 to 2007 (remaining above 50 bucks:100 does from 2006 to 2010), but have begun to steadily decline as the population has been reduced.

**Harvest Data.** Permit levels (both doe/fawn and any antelope licenses) were reduced in 2012 as the population declined. Hunter success on Type 1 and Type 7 licenses has declined in the past 3 years and reflects the relative abundance of buck antelope and doe/fawn groups in the damage prone area targeted by Type 7 licenses. Similar hunter success on the hunt area-wide Type 6 licenses reflects the ability of hunters to find doe/fawn antelope when given greater flexibility in areas to hunt.

**Population.** Conservative hunting seasons and good fawn production (for this herd) allowed this population to substantially exceed the objective by 2005. Measures were taken to increase harvest from 2007-2011, and the population declined below the objective in 2011. Recent poor fawn crops (31:100 in 2008, 26:100 in 2009, 32:100 in 2010, 39:100 in 2011, 30 in 2012), coupled with increased female harvest, have reduced pronghorn numbers in this herd unit, although pronghorn damage in agricultural areas continues to be a chronic problem in this herd unit, with some damage prone areas having been addressed, while other new damage situations arise.

The "Constant Juvenile – Constant Adult Mortality Rate" (CJCA) spreadsheet model was chosen to use for the post season population estimate of this herd, as this model had the lowest relative AIC of all the models and the population estimate and trend appears to be reasonable. The postseason population estimate for 2012 is approximately 850 antelope, or 15% below the population objective.

**Management Summary**. Type 1 licenses will be reduced by 25 to preserve buck ratios and Type 6 and Type 7 licenses will be maintained to address damage situations. This should result in a postseason 2013 population of approximately 850 pronghorn that may continue to decline unless fawn recruitment improves and/or damage concerns are addressed and doe-fawn harvest is reduced.

INPUT	
Species:	Pronghorn
Biologist:	Doug McWhirter
Herd Unit & No.: Badger Basin	Badger Basin
Model date.	02/26/13

	MODELS SUMMARY	Fit	Relative AICc	Check best model Notes to create report
CJ,CA Co	Constant Juvenile & Adult Survival	99	65	☑ CI,CA Model
SCJ,SCA Se	Semi-Constant Juvenile & Semi-Constant Adult Survival	1771	1780	SCJ,SCA Mod
TSJ,CA Tir	Time-Specific Juvenile & Constant Adult Survival	27	155	TSJ,CA Model

	Objective		1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
	<b>Trend Count</b>																															
	n Estimate	Field SE																														
	LT Population Estimate	Field Est																														
	Pop (year i)	Females Total Adults	692	652	646	9//	773	808	811	892	922	1040	1046	1100	1264	1403	1526	1348	1105	901	870	813										
	ind-of-bio-year	Females 1	260	519	248	625	637	645	648	069	902	763	220	802	892	922	1004	889	745	617	609	629										
	Predicted adult End-of-bio-year Pop (year i)	Total Males	500	133	86	151	135	163	163	201	216	277	276	295	369	448	522	449	360	283	261	235										
op Model	Total		826	723	710	854	849	888	888	926	1001	1134	1142	1201	1379	1531	1674	1492	1229	1001	902	864	831									
nates from T	on (year <i>i</i> )	Females	529	501	202	206	588	583	609	611	658	673	727	737	922	840	853	849	714	574	524	540	512									
Population Estimates from Top Model	Posthunt Population (year	Total Males	148	92	31	-	53	64	06	87	133	151	198	193	214	295	335	363	296	211	147	153	147									
Pop	Predicted Pos	Juveniles	179	130	173	346	508	240	190	278	215	310	217	272	389	395	485	280	219	222	231	171	171									
	Total		1084	884	812	086	696	1003	985	1075	1089	1216	1235	1299	1469	1634	1867	1801	1549	1313	1118	1032	974									
	tion (year i)	Females	643	549	208	237	612	625	632	635	229	691	748	754	788	877	936	984	881	730	909	265	267									
	Predicted Prehunt Population (year i)	<b>Total Males</b>	248	205	131	96	148	133	160	160	197	212	271	271	289	361	439	512	440	353	278	256	230									
	Predicted F	Juveniles	192	131	173	346	209	246	193	280	215	313	217	274	391	395	492	305	228	230	236	179	177									
	7007	Lea	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2002	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2010	2018	2019	2020	2021	2023	2024 2025

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Parameters:	Optim cells
Juvenile Survival =	0.900
Adult Survival =	906.0
Initial Total Male Pop/10,000 =	0.025
Initial Female Pop/10,000 =	0.064

MODEL ASSUMPTIONS	
ex Ratio (% Males) =	20%
ounding Loss (total males) =	10%
ounding Loss (females) =	10%
ounding Loss (juveniles) =	10%
ver-summer adult survival	%86

Survival and Initial Population E				νης		_					Se																							
and Ir		SE																																
Survival	Annual Adult Survival Rates	Field Est																																
	Annna	Model Est	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91											
	Annual Juvenile Survival Rates	Field Est SE																																
	Annual	Model Est	06.0	06.0	06:0	06:0	06:0	06.0	06.0	06.0	06.0	06.0	06.0	06:0	06.0	06.0	06:0	06.0	06.0	06:0	06.0	06.0	06:0											
	Vear	ca	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2002	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2023	2024	2025

	est Rate (% of	Females	17.8	8.6	0.2	5.7	4.0	6.7	3.7	3.8	2.8	2.7	2.8	2.3	1.5	4.3	8.8	13.8	19.0	21.4	13.5	9.6	9.7									
Harvest	Segment Harvest Rate (% of	Total Males	40.3	55.3	9.92	98.5	64.6	51.4	44.0	45.4	32.3	28.6	26.8	28.9	26.2	18.3	23.8	29.0	32.7	40.2	47.1	40.0	35.9									
		Total Harvest	207	147	92	114	109	105	88	06	75	74	82	88	82	94	176	281	291	278	197	153	130									
		Juveniles	12	_	0	0	0	5	က	2	0	2	0	2	2	0	9	23	80	7	4	œ	5									
		Females	104	43	_	28	22	38	21	22	17	17	19	16	7	34	75	123	152	142	74	52	20									
		Males	91	103	91	86	87	62	64	99	58	55	99	71	69	09	92	135	131	129	119	93	75									
	0	Field SE	2.90	3.77	3.20	4.32	2.78	3.12	3.25	2.71	4.82	3.36	4.52	5.68	4.06	5.01	5.44	4.28	5.18	4.30	5.28	4.37	4.68									
ounts	Total Male/Female Ratio	Field Est	33.64	36.97	30.31	33.47	23.47	20.47	22.39	18.95	39.75	20.55	40.22	48.43	30.74	99.09	58.33	52.94	55.45	51.31	45.34	38.87	49.71									
Classification Counts	Total	Derived Est	38.60	37.36	25.72	17.87	24.22	21.24	25.30	25.15	29.15	30.63	36.25	35.88	36.71	41.18	46.95	52.03	49.95	48.38	45.91	42.79	40.54									
	atio	Field SE	2.69	2.87	3.43	99.9	3.49	4.65	3.92	4.56	4.19	5.47	3.68	4.71	5.51	4.64	5.07	3.03	3.18	3.14	4.79	3.71	3.47									
	Juvenile/Female Ratio	Field Est	29.91	23.81	33.94	64.44	34.13	39.37	30.50	44.12	31.80	45.21	28.99	36.32	49.59	45.07	52.56	31.00	25.86	31.50	38.98	30.04	31.18									
		T Derived Est	13	4	ž,	9	7	80	6	9	Σ.	2	3	4	5	9		8	6	0	_	2	3	4 4		7	8	6	0	E 9	. 8	4 rū
		Year	1993	199	199	199	199	199	199	200	200	200	200	200	200	200	200	200	200	201	201	201	201	5 5	202	20	201	201	202	202	202	2024 2025

